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## CLAIMS

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1. An apparatus comprising an imaging device, a range finder, and a processor capable of receiving and processing image and range signals to construct a three-dimensional image from said signals.

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9       2. The apparatus according to claim 1, wherein the  
10      imaging device comprises a camera.

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12       3. The apparatus according to either preceding claim,  
13      wherein the imaging device comprises a digital video  
14      camera.

15

16       4. The apparatus according to any preceding claim 2,  
17      wherein the imaging device is capable of zoom  
18      functions.

19

20       5. The apparatus according to any preceding claim,  
21       wherein the apparatus includes a display device to  
22       allow a user to view a target area using the imaging  
23       device.

24

25       6. The apparatus according to any preceding claim,  
26       wherein the apparatus includes a pan and tilt unit for  
27       panning and tilting of the range finder and/or imaging  
28       device.

29

30      7. The apparatus according to claim 6, wherein the  
31      pan and tilt unit comprises a first motor for panning  
32      of the range finder and/or imaging device, and a second  
33      motor for tilting of the range finder and/or imaging  
34      device

35

36 8. The apparatus according to claim 7, wherein the

1       first and second motors are controlled by the  
2       processor.

3

4       9.   The apparatus according to any one of claims 6 to  
5       8, wherein the pan and tilt unit includes first and  
6       second digital encoders for measuring the angles of pan  
7       and tilt respectively.

8

9       10.   The apparatus according to claim 9, wherein the  
10      outputs of the first and second encoders are fed to the  
11      processor.

12

13      11.   The apparatus according to any preceding claim,  
14      wherein the image is digitised.

15

16      12.   The apparatus according to any preceding claim,  
17      wherein the image comprises a plurality of pixels.

18

19      13.   The apparatus according to any preceding claim,  
20      wherein the image comprises a captured image.

21

22      14.   The apparatus according to any preceding claim,  
23      wherein the range finder comprises a laser range  
24      finder.

25

26      15.   The apparatus according to any preceding claim,  
27      wherein the range finder is bore-sighted with the  
28      imaging device.

29

30      16.   The apparatus according to any preceding claim,  
31      wherein the apparatus includes a compass and an  
32      inclinometer and/or gyroscope.

33

34      17.   The apparatus according to any preceding claim,  
35      wherein the apparatus further includes a position  
36      fixing system for identifying the geographical position

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1 of the apparatus.

2  
3 18. The apparatus according to claim 17, wherein the  
4 position fixing system is a Global Positioning System  
5 (GPS).

6  
7 19. The apparatus according to any preceding claim,  
8 wherein the apparatus is operated by remote control.

9  
10 20. The apparatus according to any preceding claim,  
11 wherein the apparatus is controlled by an input device.

12  
13 21. The apparatus according to claim 20, wherein the  
14 input device facilitates operation of a particular  
15 function of the apparatus.

16  
17 22. A method of generating a three-dimensional image  
18 of a target area, the method comprising the steps of  
19 providing an imaging device, providing a range finder,  
20 operating the imaging device to provide an image of the  
21 target area, and subsequently measuring the distance to  
22 each of a plurality of points by scanning the range  
23 finder at preset intervals relating to the points.

24  
25 23. A method according to claim 22, wherein the method  
26 includes the further steps of  
27 obtaining a focal length of the camera;  
28 obtaining a field of view of the camera; and  
29 obtaining a principal distance of the camera.

30  
31 24. A method according to claim 22 or claim 23,  
32 wherein the method includes the further steps of  
33 digitising the image to provide a plurality of  
34 pixels within the digital image;  
35 calculating horizontal and vertical angles between  
36 a reference point in the image and each pixel;

1       moving the range finder through the horizontal and  
2       vertical angles whereby the range finder is  
3       directed at each pixel in sequence; and  
4       actuating the range finder to obtain a range to  
5       the target corresponding to the position of the  
6       pixel.

7

8       25. A method according to claim 24, wherein the method  
9       includes the additional steps of  
10      assigning x and y coordinates for each pixel  
11      within the image;  
12      correlating the range to the target with each  
13      pixel within the image; and  
14      calculating three dimensional coordinates of the  
15      pixels to reconstruct a three dimensional image of  
16      the target area.

17

18       26. A method according to claim 25, wherein the method  
19       includes the additional steps of  
20      plotting each of the three dimensional points of  
21      the image; and  
22      superimposing a wire frame over the image  
23      connecting each of the three dimensional points.

24

25       27. A method according to claim 26, wherein the method  
26       includes the additional step of superimposing the image  
27       on the wire frame to reconstruct a three dimensional  
28       image of the target area.

29

30       28. A method according to any one of claims 24 to 27,  
31       the method including the further steps of  
32      obtaining a horizontal offset and a vertical  
33      offset between an axis of the camera and an axis of the  
34      range finder;  
35      calculating the horizontal and vertical offsets in  
36      terms of pixels;

1        calculating the difference between the horizontal  
2        and vertical offsets in terms of pixels and the x and y  
3        coordinates of the target pixel; and

4        calculating the horizontal and vertical angles.

5  
6        29. A method according to any one of claims 24 to 28,  
7        wherein the method includes the further steps of  
8        providing the range finder and/or camera on a pan  
9        and tilt unit;

10      providing angle encoders to measure the angles of  
11     pan and tilt of the unit;

12      instructing the pan and tilt unit to pan and tilt  
13     the range finder and/or camera through the vertical and  
14     horizontal angles;

15      measuring the horizontal and vertical angles using  
16     the encoders;

17      verifying that the angles through which the range  
18     finder and/or camera are moved is correct;

19      obtaining horizontal and/or vertical correction  
20     angles by subtracting the measured horizontal and  
21     vertical angles from the calculated horizontal and  
22     vertical angles;

23      adjusting the pan and tilt of the range finder  
24     and/or camera if necessary; and

25      activating the range finder to obtain the range to  
26     the target.

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